

1 **Amendment to the Specification**

2 **In the Specification:**

3 Please amend the specification as follows:

4 Nine (9) sequential paragraphs were added to the specification beginning at Page 25
5 (before the paragraph and heading beginning at line 29), by the Amendment dated May 4, 2005,
6 however, Page 25 of the application as filed ended at approximately line 10. Clearly, the
7 insertion instructions for those nine sequential paragraphs in the Amendment dated May 4, 2005
8 was incorrect.

9 Those same nine sequential paragraphs were added to the specification
10 beginning at Page 7 (before the paragraph and heading titled Brief Description
11 of the Drawing Figures beginning at line 29), by the Amendment dated
12 October 20, 2005 (submitted on October 24, 2005). Page 7 represented to the correct insertion
13 point.

14 While the Amendment dated October 20, 2005 (submitted on October 24, 2005) added the
15 nine sequential paragraphs to the correct portion of the application, that amendment failed to
16 cancel the nine sequential paragraphs incorrectly added to the specification beginning at Page 25
17 by the Amendment dated May 4, 2005.

18 Please cancel the nine sequential paragraphs incorrectly added to the specification
19 beginning at Page 25 by the Amendment dated May 4, 2005.

20 For clarification, the nine sequential paragraphs to be canceled (beginning at page 25) are
21 as follows (please note that these paragraphs were added to twice; the paragraphs added to the
22 Summary of the Invention section should remain, while the paragraphs added to the Description
23 of the Preferred Embodiment section should be cancelled):

24 ~~Another aspect of the present invention is a microreactor for use in the modular reaction~~
25 ~~system, for reacting one chemical with at least one other chemical, for the purpose of forming a~~
26 ~~chemical product. The reactor includes a plurality of simple plates, each simple plate having at~~
27 ~~least one opening formed therein, the simple plates being stacked together to form a plurality of~~
28 ~~layers and arranges so that at least one opening in each simple plate overlaps at least one other~~
29 ~~opening in an adjacent simple plate, thereby forming at least one pathway between at least some~~
30 ~~of the layers.~~

1 Preferably, openings within different layers align so as to form at least one inlet port and at
2 least one outlet port, for the receipt and discharge of chemicals, and to form at least one pathway for
3 conveying chemicals to be processed. At least one pathway is formed that is in fluid connection with
4 the inlet and outlet ports, and each simple plate has at least one opening formed in it.

5 A material from which the simple plates are fabricated is selected for compatibility with the
6 chemical process. In one embodiment, the simple plates are formed from a material selected from the
7 group consisting of crystalline wafers, ceramics, glasses, polymers, composite materials, and metals.
8 Preferably, if formed from a metal, stainless steel is used. The material of the crystalline wafer is
9 selected from the group consisting of silicon and germanium.

10 It is also preferable that the reactor accommodate a plurality of operations,
11 including temperature control, control of chemical residence time, chemical mixing, and
12 chemical reacting. Temperature control is achieved using a combination of one or more
13 temperature sensors and one or more heat exchangers. Preferably, chemical mixing is carried out
14 by employing pathways sized so that a reactant achieves a stacked laminar flow with respect to at
15 least one other reactant.

16 In a reactor adapted for processing at least two reactants to form a desired chemical product,
17 an inlet opening for each of the reactants and an outlet opening for the chemical product is provided
18 in at least one of two outer simple plates. An intermediate simple plate is included for mixing the
19 reactants and has at least one opening in fluid communication with each inlet opening and the outlet
20 opening.

21 Generally, at least one heat transfer fluid inlet port is included in at least one of the outer
22 simple plates, so that at least one heat transfer fluid can be introduced into the chemical reactor. Each
23 heat exchanger is defined by an opening in a different intermediate simple plate. The opening is in
24 fluid communication with the heat transfer fluid inlet and outlet ports and is disposed between
25 adjacent simple plates.

26 Preferably, each heat exchanger is used to modify the temperature of at least one of the
27 reactants and/or the chemical product. The heat exchangers can be used to modify a temperature of
28 one of two reactants such that they are at different temperatures.

1 ~~The thickness of the outer simple plates is about 3 millimeters, and that of the plurality of~~
2 ~~intermediate simple plates is at least about 0.2 millimeters, but not more than about~~
3 ~~0.6 millimeters.~~

4 ~~Preferably, when the thickness of the intermediate simple plates that are adjacent to a heat~~
5 ~~exchanger is about 0.3 millimeters. When a series of openings in the simple plates of the chemical~~
6 ~~reactor defines a fluid path for a heat transfer fluid that flow through more than one heat exchanger,~~
7 ~~the flow rate and fluid pressure of the heat transfer fluid within each such heat exchanger are~~
8 ~~substantially.~~